In all years displayed, Montana's overall (i.e. all cause) age-adjusted rates are below those for the U.S. This is true for many of the chronic diseases displayed; Montana's rates for heart disease, cancer, nephritis, and chronic liver disease and cirrhosis were lower than those for the U.S in eight or nine of the years for which both Montana and U.S. values are displayed. Cancer experienced a marked increase in 2001, the significance of such a single point is not apparent, though it was preceded by two years of the same ICD coding, suggesting that the rate has not been influenced by the recent ICD revision. These underlying causes accounted for slightly more than half (50.1%) of all deaths of Montanans in 2001. Values of the age-adjusted death rates for nephritis and Alzheimer's were increased while that for pneumonia and influenza was decreased by the conversion to ICD-10.

Montana's rates for cerebrovascular disease, pneumonia and influenza, and diabetes showed inconsistent relationships with the U.S. rates, with the trend lines crossing each other more than once in this period. Diabetes rates for Montana were higher than those for the U.S. in three of the seven years in which underlying cause of death was determined with the rules of ICD-9. The U.S. diabetes rate seems relatively unaffected by the conversion to ICD-10 while the Montana diabetes rate appears less stable (but this may be the result of a change in a relatively small number of deaths from diabetes and have nothing to do with the revision of ICD). Montana's rates for cerebrovascular disease were higher than those of the U.S. for five of the seven years in which ICD-9 coding rules were used. Montana and U.S. rates for this cause were nearly identical under ICD-10 coding rules. It is not apparent that ICD revision had any effect on these rates.

The state rates for chronic lower respiratory disease (C.L.R.D.)--which includes chronic and unspecified bronchitis, emphysema, and asthma--were higher than those for the U.S. in all years displayed. Revision of ICD did not change this relationship. Montana's Alzheimer's rate was virtually the same as that of the U.S. in 1997, but higher in all other years. Revision of ICD substantially increased both Montana and U.S. rates.

Montana's rates for the traumatic causes of death displayed, accidents (both motor vehicle and non-motor-vehicle) and suicide, were higher than those for the nation in all years displayed, irrespective of the ICD coding rules. These rates do not appear to have been affected by ICD revision.

It is also instructive to examine the change in Montana's rates over time. These graphs show reductions in Montana's overall death rates and rates for specific chronic diseases such as heart disease, cancer (although 2001 rate was elevated above the trend established over the previous nine years), and cerebrovascular disease. The rates for nephritis (and perhaps diabetes) are on the increase, although the trends are somewhat inconsistent and possibly affected by the conversion of ICD coding. There seems to be no clear trend for the other causes of death displayed.

AGE, SEX, AND RACE

Cause of death is age, sex, and race-dependent. Until 2001, heart disease and cancer were the first and second leading causes of death in Montana, claiming the largest numbers of persons of all races and both sexes. However, in 2001 cancer was the leading cause of death among Native American males, with circulatory diseases and accidents tying for the second leading cause. Females dying of heart disease tended to be older than males, although this disparity tended to diminish after the age of 49. After 55 years of age, the proportion of women who died from heart disease was essentially the same as that for men. Persons less than 50 years old who died of cancer were most often women; those older than 50 were most often men. The majority of cancer deaths occurred after the age of 55 for both sexes.

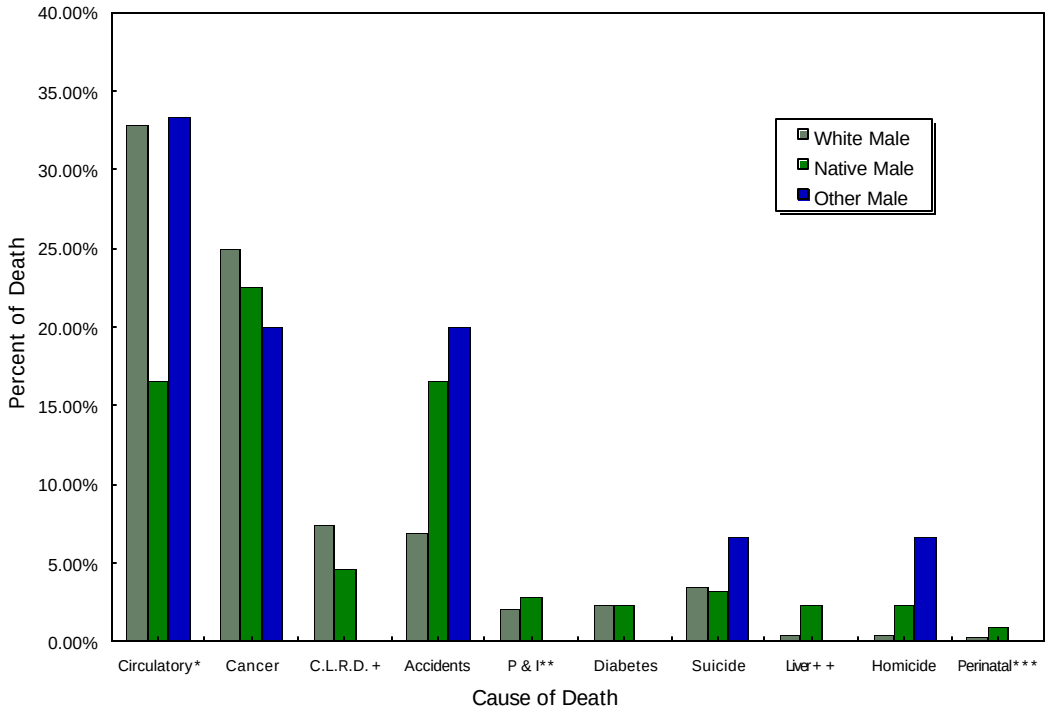
The frequency of Montana resident deaths by sex and age is shown in **Table 9** for 358 selected causes of death. The frequency of death by sex and race is shown in **Table 10** for 113 selected causes of death. These causes are used by National Center for Health Statistics (NCHS) for ranking causes of death. Those causes preceded by a pound sign (#) are used for ranking causes for decedents of all ages. **Figure 44** shows, graphically, the percent

distribution for over three-quarters (77.8%) of these deaths by cause and race categories for males. **Figure 45** shows the distribution among these underlying causes of death for females.

When shown as a proportion of all deaths for calendar year 2001, circulatory system diseases (which include the first and third "rankable" causes of death—heart disease and cerebrovascular disease—as well as atherosclerosis) accounted for the greatest percentage of deaths of all causes shown for the white population (33.8% of both white males and white female decedents). Only 19.2% of Native American male and female decedents died of diseases of the circulatory system--primarily heart disease, cerebrovascular disease and atherosclerosis. Twenty-two percent of both male and female Native Americans died from cancer compared to 23.8% of white male and white female decedents. Accidents tied with cancer as the second leading cause of deaths for Native American males, accounting for 16.5% of their deaths; the proportions of accidental deaths were smaller for Native American females (10.2%), white females (3.5%), and white males (6.8%).

Figure 44

PERCENT DISTRIBUTION OF DEATHS BY SELECTED CAUSE AND RACE
MALE MONTANA RESIDENTS, 2001



***** Diseases of the Circulatory system
+ Chronic Lower Respiratory Disease (C.L.R.D.)
****** Pneumonia and Influenza
++ Chronic Liver Disease and Cirrhosis
******* Certain Conditions Originating in the Perinatal Period

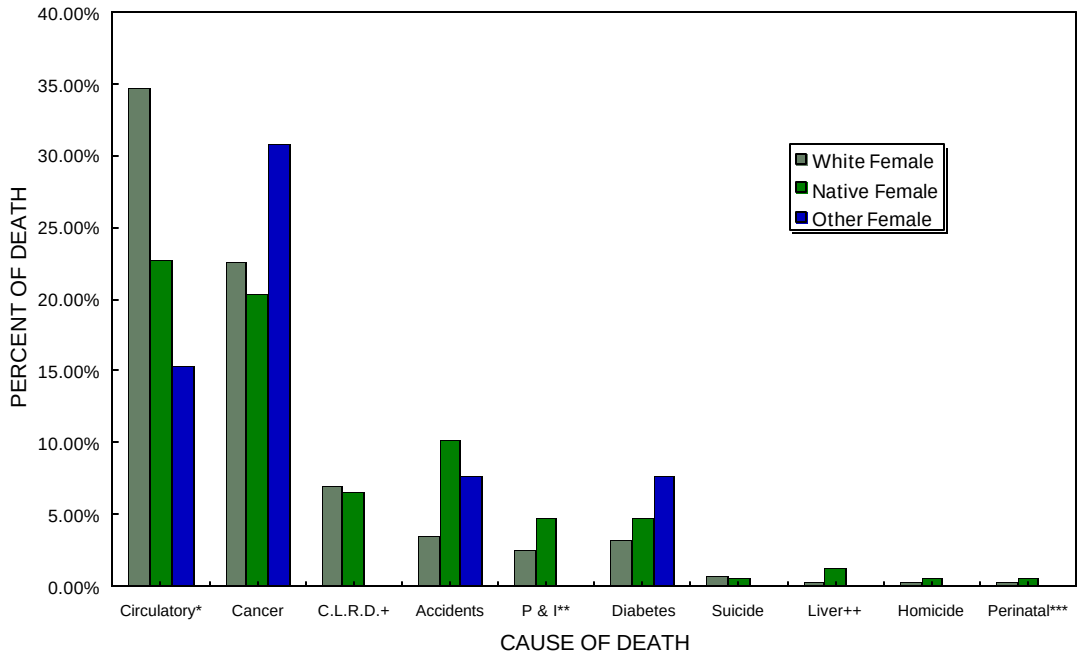
Homicide, suicide, chronic liver disease and cirrhosis, and conditions originating in the perinatal period did not constitute large percentages of deaths in any of these groups, but the distribution among races and sexes is of

interest. The proportion of deaths from homicides for Native American males was 2.3 %, roughly six times that for white males. Predominantly, individuals who committed suicide were males. Three and five-tenths percent of white male decedents committed suicide while only 0.7% of white female decedents did so. Corresponding percentages for Native Americans were 3.2% for males and 0.6% for females.

About four-tenths of one percent of white males and 0.3% white female decedents died of chronic liver disease and cirrhosis. These proportions were much larger for Native American males (2.3 %) and females (1.2%). Nine-tenths of Native American male decedents and 0.6% of Native American female decedents died of conditions originating in the perinatal period. Corresponding proportions for white decedents were 0.25% and 0.29% for males and females, respectively.

Figure 45

PERCENT DISTRIBUTION OF DEATHS BY SELECTED CAUSE AND RACE



FEMALE MONTANA RESIDENTS, 2001

* Diseases of the Circulatory system
\+ Chronic Lower Respiratory Disease (C.L.R.D.)
** Pneumonia and Influenza
++ Chronic Liver Disease and Cirrhosis
*** Certain Conditions Originating in the Perinatal Period

Those who died of heart disease were most likely men older than age 35. After 35, the deaths due to heart disease were predominantly men until after 55 years of age; then the women's proportion was roughly equal to that of men. Victims of accidental death in 2001 were most likely to be men in their late teens to early twenties or in their

early forties. The Montana resident committing suicide was likely to be a man, nearly 10% were males younger than 25 years old but two thirds (67%) were between 25 and 64 years old; in all age groups, the use of a firearm was the most common method. Montana resident homicide victims were most likely to be males (21 males compared to 10 females). Nearly 61% of the homicides involved use of a firearm and though more rare, the majority of female homicides were committed with a firearm (70%).

Table 9 also shows the frequency of accidental deaths of Montanans by age at death and type of accident. Motor vehicle accidents accounted for the majority of accidental deaths for those from 10 to 64 years of age (90%) and one-third of the accidental deaths of infants.

Figure 46 displays leading causes of death by age group for Montana residents. In 2001, sudden infant death syndrome, certain conditions originating in the perinatal period, and congenital anomalies, accounted for two-thirds of the infant deaths. Deaths due to conditions originating in the perinatal period —including maternal factors and complications of labor and delivery, birth trauma, infections, and respiratory, cardiovascular, and digestive system disorders specific to this period— were the leading cause of death in the "under one year" age category—(32.9%), followed by congenital anomalies—including malformations of the nervous system, eye, ear, face, neck, and circulatory, respiratory, and digestive systems—(28.8%). **Table 12** displays the frequency of infant death by race, age in days, and 130 selected causes of death. Those causes preceded by a pound sign (#) are used for ranking causes for infants only. Only 12 Montana decedents were between the ages of one and four years in 2001. Accidents (25.0%), congenital anomalies (25.0%) and homicide (16.7%) were the leading cause of death for these decedents.

Accidents were more likely to cause the deaths of the young than the old. They accounted for 18.3% of the deaths of those 14 years of age or younger, 60% of the deaths of those between the ages of 15 and 24, and nearly 41% of those between the ages of 25 and 34 years. By contrast, accidents accounted for less than 6% of the deaths in the entire population. Suicide was the cause of death for 18.2% of the decedents between the ages of 15 and 44. By contrast, it was the cause of death for only 2.1% of decedents of all ages. Of the suicide victims, 85.4% were males.

For decedents more than 34 years of age, chronic diseases—particularly heart disease and cancer—increased in influence. Cancer, followed by heart disease, was the leading cause of death for all of the age categories between 45 and 74 years. However, for the age categories 75 and older, heart disease was the leading cause, with cancer second.

For the all-age category, heart disease (23.8 %) was the leading cause of death, followed closely by cancer (23.7 %). C.L.R.D. (7.1 %), cerebrovascular disease (7.0 %), and accidents (5.7 %) were a distant third, fourth, and fifth, respectively. Frequencies and crude rates for the ten leading causes of death are shown for Montana and each of its counties in **Table 26**.